1) $y = \frac{\ln(\lg(\sin(e^{-x})))}{-e^2}$;

2) $y = \frac{\sin(\ln(3\mathrm{x}))\cdot\sqrt[3]{arcsin(-2x^2)}}{-2}$;

3) $y = \frac{arcctg^2(2-x^2)}{3-\cos(2x)}$;

Ats.:

1. $y' = \frac{1}{-e^2} \cdot \frac{1}{\lg(\sin(e^{-x}))} \cdot \frac{1}{\sin(e^{-x})\ln(10)} \cdot \cos(e^{-x}) \cdot e^{-x} \cdot (-1)$;

2. $y' = (uv)' = u'v + uv' = \frac{1}{-2} \cdot \left(\cos(\ln(3x)) \cdot \frac{1}{3x} \cdot 3 \cdot \sqrt[3]{arcsin(-2x^2)} + \right.$
$\left. \sin(\ln(3\mathrm{x})) \cdot \frac{1}{3}\left(arcsin(-2x^2)\right)^{-\frac{2}{3}} \cdot \frac{1}{\sqrt{1-(-2x^2)^2}} \cdot (-4x)\right)$;

3. $y' = \left(\frac{u}{v}\right)' = \frac{u'v-uv'}{v^2} =$
$\frac{2arcctg(2-x^2)\cdot\left(-\frac{1}{1+(2-x^2)^2}\right)\cdot(-2x)\cdot(3-\cos(2x))-arcctg^2(2-x^2)\cdot\sin(2x)\cdot 2}{(3-\cos(2x))^2}$